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Round out your EDP knowledge!

FUNDAMENTALS OF

DATA COMMUNICATIONS

March 9-11/Los Angeles • April 6-8/New York

April 13-15/Chicago • April 29-May 1/San Francisco

PLUS June 8-10/Boston area • August 26-28/New York • September 21-23/San Francisco

A comprehensive study of the elements of data communications — meets the needs of data processing systems and operation personnel new to the DC field.

Make your EDP systems more responsive and cost-effective!

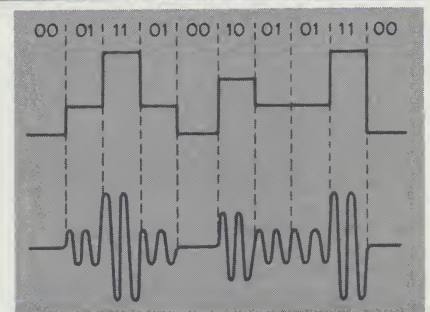
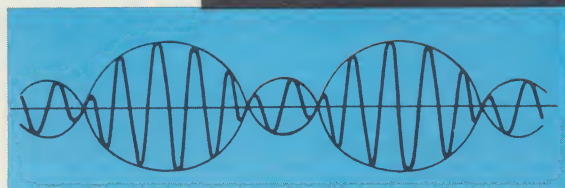
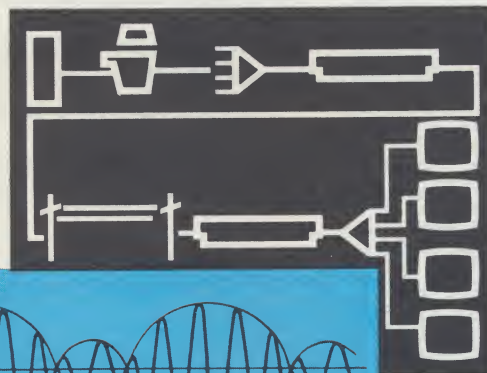
ADVANCED DATA COMMUNICATIONS:

TECHNIQUES FOR SYSTEMS ANALYSIS AND DESIGN

March 23-25/San Francisco • May 4-6/Washington, D.C. area • May 11-13/Chicago

PLUS September 16-18/New York • November 4-6/Chicago • December 14-16/Newport Beach, CA

An intensive course for EDP professionals with a solid background in EDP systems analysis and design who seek an update on data communications facilities.



**AMERICAN
MANAGEMENT**
ASSOCIATIONS

Information Systems & Technology Division

MEMO TO THE EDP MANAGER:

Meet the demands of the 80s for efficient systems and competent personnel. Get the information you need to merge EDP and data communications technology for accurate, up-to-the-minute operating information and immediate access to that information.

To respond to your needs, we now offer two courses to suit your particular background and experience: for EDP personnel new to the data communications environment, we offer a basic foundation course — for the experienced professional, we provide an update of current techniques and facilities for developing cost-effective, functional systems.

FUNDAMENTALS OF DATA COMMUNICATIONS is designed for personnel who want an introduction to data communications concepts and systems. The course zeros in on all the elements of data communications systems — including comprehensive coverage of every facet involved. Up-to-date information is presented in lecture form — definitions of basic DC terminology are taught and reinforced.

ADVANCED DATA COMMUNICATIONS: TECHNIQUES FOR SYSTEMS ANALYSIS AND DESIGN is intended for EDP professionals with a solid foundation in systems analysis and design. Advanced techniques in designing on-line systems are featured along with a case study which runs throughout the entire course. EDP professionals grounded in the fundamentals of data communications will have the opportunity to develop practical techniques for achieving top EDP performance at minimal cost.

Team attendance is highly recommended for both courses — and special fees are available — the enclosed Registration Information provides details on prices for teams.

I look forward to seeing you and your staff at these informative sessions on data communications systems.

Sincerely,



Alicia Evereklian



FUNDAMENTALS OF

DATA COMMUNICATIONS

IN LOS ANGELES/MARCH 9-11, 1981

AMFAC HOTEL 213/670-8111

Meeting No. 6564DH-53

COURSE LEADER

EUGENE F. McLAUGHLIN, *President*, E. F. McLaughlin and Assoc., Inc., Rockville, MD

IN NEW YORK/APRIL 6-8, 1981

AMA HEADQUARTERS

Meeting No. 6564DH-62

COURSE LEADER

EUGENE F. McLAUGHLIN, *President*, E. F. McLaughlin and Assoc., Inc., Rockville, MD

IN CHICAGO/APRIL 13-15, 1981

AMA MANAGEMENT CENTER

Meeting No. 6564DH-54

COURSE LEADER

GARY AUDIN, *President*, Delphi, Inc., Pompton Lakes, NJ

These 3-day meetings start Monday, 9:30 a.m.; end Wednesday, 4:00 p.m.

IN SAN FRANCISCO/APRIL 29-MAY 1, 1981

SAN FRANCISCO 415/573-7661

Meeting No. 6564DH-55

This 3-day meeting starts Wednesday, 9:30 a.m.; ends Friday, 4:00 p.m.

COURSE LEADER

GARY AUDIN, *President*, Delphi, Inc., Pompton Lakes, N.J.

Future Sessions:

June 8-10/Boston area

August 26-28/New York

September 21-23/San Francisco

Meeting No.

6564DH-56

6564DH-57

6564DH-58

Here's an in-depth course in the elements of data communications that gives you the background you need to analyze data transmission...and make it work for you. Through group discussion, question and answer sessions, and classroom exercises, you'll discover:

- How to analyze the essential components of DC systems — terminals, transmission equipment and services, communications processors and software — and their impact on systems design
- How to select from the wide range of available terminals — interactive, hard-copy teleprinters, batch intelligent and CRT display — and make sure you get the equipment that suits your specific needs
- How to evaluate pricing and other factors in order to make the right choice from various transmission services including conventional or specialized carriers, digital services, satellites, Western Union and value-added networks
- Advantages and disadvantages of various protocols, including asynchronous, synchronous, binary synchronous, bit-oriented, etc.
- The key-design calculations you need to make in order to plan or improve data communications systems — (during the course you'll get actual classroom practice in working out both throughput and response time performance calculations)
- Key facts about network architectures, including the concept of networking, integration of data communications and data processing, and available and expected products

Who should attend: This course is designed for all data processing systems and operational personnel who want to learn the elements of data communications systems, including Systems Analysts, Programmer/Analysts, Computer Specialists, Operations and Communications personnel, and Managers in these areas.

For more immediate access to the information you need — at a price you can afford — register for this instructive course today!

HERE'S WHAT YOU'LL COVER IN

FUNDAMENTALS OF DATA COMMUNICATIONS

Concepts and Terminology

- Terminology. Synchronous vs. Asynchronous transmission. Error control. Protocols. Networks. Half and Full Duplex. Codes.

The Data Communications Environment

- The application of computer communications to business
- Basic types of data communications systems
- Network alternatives and configurations
- Defining the configuration components of a data communications system: *Transmission facilities/Terminals and controllers/Modems and multiplexors/Host processors/Data communications software/Front end processors.*

Terminals and Their Applications

- Dependence of terminal selection upon application
- Categorizing terminals by functional characteristics: *Interactive terminals/Hard-copy teleprinters/Batch/Intelligent/CRT display terminals.*
- Terminal application exercise
- Teleprinter selection: *Basic transmission and control characteristics/Impact vs. non-impact printers/Basic transmission and control characteristics/Character make-up on display/Edit features/Peripheral devices/Programmable capabilities.*
- Batch terminal selection: *Price/performance/Data throughput rates/Reliability and services/Flexibility in terms of local processing.*
- Peripheral configuration alternatives
- Review of application advantages

Intelligent Terminals

- Equipment configuration. Processing capabilities.
- Multi-function applications: *Data entry/Text processing/Distributed processing*
- User developed software

Transmission Equipment

- Functions of modems: *Modulation-demodulation/Acoustical coupling.*
- Alternatives to modems: *Voice grade/Short haul/Wideband.*
- Effects of modems on line turnaround and response time.
- Multiplexor systems: *Frequency Division (FDM)/Time Division (TDM)/Statistical Time Division (STDM)/Operation and application*
- Guidelines for evaluating and selecting a supplier: *Selection criteria — lease, purchase, rent/Maintenance/Supplier size.*

Network Control

- Diagnostics/ Test features/ Hardware/ Technical control/ Patching and switching arrangements/ Operational considerations.

Data Transmission Services

- Service suppliers: *Conventional carriers/Specialized carriers/Digital services/Satellites — RCA, AMSAT, Western Union/Value-added networks — TELENET, TYMNET, FAX-PAK.*
- Services and pricing: *Using the public switch network/ Dedicated lines — analog, digital/Satellite channels/ Cost elements in the data transmission channel.*
- Value-added networks
- Competitive pressures and future offerings: *ACS, SBS, XTEN*

Protocols

- Asynchronous/Synchronous/Binary synchronous/Bit-oriented — HDLC, SDLC, ADCCP, etc./DEC'S, DDCMP/ X.25 and impending protocol standards.

Exercise: Performance Calculations

- Throughput calculation — sample problem.
- Response time calculation — sample problem.

Communications Processors

- Applications: *Programmable terminals/Terminal controllers/ Concentrators/Front ends processors/Switching systems/ Host processors*
- Advantages of communications processors: *Workload distribution/ Cost/ Efficiency/ Reliability/ Growth expansion/ Emulation/ Vendor offerings*

Communications software

- Batch vs. data communications software: *Basic operation/ Workflow/Application control/ Database interface.*
- Software functions and characteristics: *Front ends/ Terminals.*
- Access methods
- Operational considerations: *Network control/ Performance and response time/ Restart—recovery/ Maintenance.*
- Evaluating software products: *Minicomputers/ Main frames/ Data communications monitors.*

Network architectures

- Concept of networking/ Computer communications architectures/ Integration of data communications and data processing/ Available and expected products.



FREE BONUS!

Everyone who attends this meeting will receive free: FUNDAMENTALS OF DATA COMMUNICATIONS by Jerry Fitzgerald and Tom S. Eason.

ADVANCED DATA COMMUNICATIONS:

TECHNIQUES FOR SYSTEMS ANALYSIS AND DESIGN

IN SAN FRANCISCO/MARCH 23-25, 1981
MIYAKO HOTEL 415/922-3200

Meeting No. 6565DH-64

COURSE LEADER:

EUGENE F. McLAUGHLIN, *President*, E. F. McLaughlin & Associates, Inc., Rockville, MD.

IN RESTON, VA. (WASHINGTON, D.C. AREA)/MAY 4-6, 1981
SHERATON INTERNATIONAL CONFERENCE CENTER 703/620-9000

Meeting No. 6565DH-65

COURSE LEADER:

ROBERT L. ELLIS, *President*, The ARIES Group, Rockville, MD.

IN CHICAGO/MAY 11-13, 1981
AMA MANAGEMENT CENTER

Meeting No. 6565DH-69

COURSE LEADER:

ROBERT L. ELLIS, *President*, The ARIES Group, Rockville, MD.

Each 3-day meeting starts Monday, 9:30 a.m.; ends Wednesday, 4:00 p.m.

Future Sessions:

September 16-18/New York

November 4-6/Chicago

December 14-16/Newport Beach, Ca.

Meeting No.

6565DH-66

6565DH-67

6565DH-68

This course is designed to help you fulfill your company's growing need for operating information to meet competitive market pressures. It will show you how to give management greater on-line, real-time access to corporate computing resources.

It will bring you up to the minute on practical new techniques and facilities available to solve today's — and tomorrow's — system requirements... and show you how to use them to achieve a system that gives you the capability you require at the lowest possible cost.

You'll discover:

- How to define your network requirements
- How to provide overall control for the network and analyze network usage and performance
- Effective techniques of applications processing
- How to evaluate terminal types for use in your system
- How to build flexibility and cost-effectiveness into the system
- Factors to consider in choosing the network architecture
- Where to locate your communications processing
- How to evaluate trade-offs between centralized and distributed processing systems
- And more!

Who should attend: This seminar is designed for EDP professionals with a solid foundation in EDP systems design and programming, as well as some basic knowledge of the principles and concepts of data communications. It will also be valuable to Project Leaders, Systems Analysts/Planners, Computer Specialists, or other individuals desiring an understanding of the techniques required to analyze, design and implement any component of a data communications system, including terminals... network facilities... and communications hardware and software processing resources.

HERE'S WHAT YOU'LL COVER IN

ADVANCED DATA COMMUNICATIONS:

TECHNIQUES FOR SYSTEMS ANALYSIS AND DESIGN

Review of Basic Data Communications Concepts and Terminology: A Focus on Relevant Details and Examples of Each Facility Described

- **Terminal functions (Media Conversion):** *Classes of terminals* — CRT, hardcopy, specific application/range of terminal capabilities — *display-only, limited intelligence, full-function intelligent devices*
- **Data transmission** — analog vs. digital transmission, transmission speeds, modes of data transmission (simplex, half-duplex, duplex)
- **Data communications networks (Network control and administrative functions)** — data communications networks to provide: message control, message accounting, multiplexing and concentration, network access control and security, TCUs and intelligent controllers
- **Host applications processing** — application programs to provide: on-line information access, various classes of applications (banking, order entry, real-time process control)/relevant considerations in application design affecting: performance, maintainability, recovery, data security

Media Conversion (Terminal Devices)

- **Evaluation of various terminal types — operating characteristics including:** human or man-machine factors, terminal environment considerations, terminal-to-network interface considerations — impact on performance, compatibility/cost-effectiveness considerations, flexibility for future growth and change, operator training requirements — long and short term systems, matters of vendor support, maintenance, contract terms and conditions
- **Discussion of comparison cost/benefit relationship for various terminal types to solve operational problems:** types include slave/dumb, intelligent or brilliant

Data Transmission

- **Developing a network requirements definition including:** techniques to determine transmission requirements — alternative network architectures presented including leased and switched lines, point-to-point communications, multipoint (multidrop) line configurations — considerations affecting distributed network intelligence and multinodal distribution techniques
- **Critical design considerations** — how design considerations affect: solution of carrier facilities, overall network control, network reliability and security, techniques for measuring

network performance, techniques for measuring anticipated response times, private vs. public networks, requirements for networks to accommodate multiple terminal types, requirements to provide access capability to multiple data base systems

Communications Processing

- **How to provide overall control for the network**
- **How to get management information needed to permit analysis of network usage and performance**
- **Impact of communications processing on system effectiveness** — how transmission costs can be lowered, how multiple terminal types can be used in a single network, how a single terminal type can access multiple applications and data bases
- **Location of communications processing** — different requirements for embedding system within a central host, remote node or remote terminal
- **Technical analysis of front-end processor and teleprocessing monitors** — guidelines for evaluating competitive products, how to select those which satisfy specific teleprocessing system requirements

Applications Processing

- **System design and development considerations unique to on-line data communications systems** — screen/format design, operator dialogues, terminal independence, password or sign-on control, intermodule communication, system restartability, recovery/elements of system performance and response time including: impact of file utilization, pack placement, file contention, processor utilization, transmission delay
- **Applied data communications systems** — transaction processing, data collection, on-line inquiry
- **Assessing trade-offs between centralized and distributed processing systems**
- **Existing hardware/software configurations vs. new configurations** — implementation factors

Future Applications of Data Communications

- **Envisioned future changes in media conversions (terminals)** — transmission facilities and communications processing
- **Overview of data communications systems** — serving as support to both office and personal/home automation

MEET YOUR COURSE LEADERS

FUNDAMENTALS OF DATA COMMUNICATIONS

EUGENE F. McLAUGHLIN, *President*, E. F. McLaughlin & Associates, Inc., Rockville, Md.

E. F. McLaughlin & Associates is an independent consulting firm specializing in marketing and technological studies of data communications and teleprocessing products and systems. Formerly, Mr. McLaughlin was Vice President of Richard L. Deal & Associates where he was responsible for new product development, new business areas and professional seminars. He is a frequent lecturer on data communications and teleprocessing.

ADVANCED DATA COMMUNICATIONS: TECHNIQUES FOR SYSTEMS ANALYSIS AND DESIGN

ROBERT L. ELLIS, *President*, The ARIES Group, Rockville, Md.

Mr. Ellis has designed the telecommunications networks of some 20 companies, including the customers of eight telephone companies, covering a wide variety of applications including brokerage networks, interactive banking networks, and a national on-line bibliographic service.

For more information about either of these courses, contact Alicia Evereklian, Program Director at AMA Headquarters in New York (212) 586-8100.

2.2 Continuing Education Units (CEUs) awarded for successful completion of each of these courses.

Ask about in-house training! For details about related in-house versions of these programs, contact AMA's In-House Development and Training Division in New York: (212) 586-8100, Ext. 162.

Free! AMA Courses for Developers and Users of Computer Systems

A brand new catalog featuring a complete schedule of important meetings from the Information Systems & Technology Division. You'll find courses dealing with the latest technical advances and proven techniques, including systems analysis and design, teleprocessing, structured systems, minicomputers, distributed processing, and more. The courses also include a wide range of data processing applications: finance, accounting, human resources, purchasing and marketing. Check the box on the Registration Card to receive your complimentary copy of this guide to using today's sophisticated technology more effectively and more profitably.

REGISTRATION CARD

American Management Associations 135 West 50th St., New York, N.Y. 10020

Register Fast by Phone (212) 246-0800. For registering only. Mention the Priority Code shown on or adjacent to the mailing label on this announcement. All other calls: (212) 586-8100. **IMPORTANT!** To expedite your registration, fill in the **Priority Code** shown on or adjacent to the mailing label on this announcement.

Please register me for the indicated session of:
FUNDAMENTALS OF DATA COMMUNICATIONS

- ☐ March 9-11/Los Angeles
Meeting No. 6564DH-53
- ☐ April 4-6/New York
Meeting No. 6564DH-62
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Meeting No. 6564DH-58

ADVANCED DATA COMMUNICATIONS: TECHNIQUES FOR SYSTEMS EVALUATION AND DESIGN

- ☐ March 23-25/San Francisco
Meeting No. 6565DH-64
- ☐ May 4-6/Washington, D.C. area
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- ☐ December 14-16/Newport Beach, CA
Meeting No. 6565DH-68

Name

(Please print)

Title

Company

(Please use full name)

Division

Street

City

State

Zip

Tel. No.

(area code)

☐ This confirms telephone registration

Please list names and positions of team registrants on an additional sheet.

PAYMENT INSTRUCTIONS:

The full fee is payable in advance. ☐ Payment enclosed. ☐ Bill my company.

PLEASE SEND THE FOLLOWING:

☐ AMA Membership Information. ☐ AMA Courses for developers and users of computer systems.

For office use only.

NP 6-3266/Printed in U.S.A.

REGISTRATION INFORMATION

Important: Always give the complete meeting number and title — plus the **Priority Code** shown on or adjacent to the mailing label on this announcement. This will expedite your registration.

3 WAYS TO REGISTER FAST

- **Phone (212) 246-0800.** (Direct Line to Registrar *Only*.) Other calls dial (212) 586-8100.
- **TWX 710-581-6530**
- **Complete and mail the registration card**

Registration Fees The full fee is payable in advance and includes the cost of meeting materials.

Individual fees	AMA Members	Nonmembers*
Each 3-day Meeting	\$550	\$630

Send Teams at reduced fees— During the meeting they'll compare notes and pool thinking on how the ideas and concepts presented relate to your company's specific problems. Back on the job, they'll be able to tackle these problems with a highly coordinated team approach. **The special fees for a company team of three managers attending the same session of a meeting are:**

Team fees	AMA Members	Nonmembers*
Each 3-day Meeting (per person)	\$470	\$540

Note: Other discounts are available for larger groups. For details please contact AMA's Registrar.

***Nonmembers:** Difference between member and nonmember registration fee can be applied to AMA membership. Check box on card for full information.

Check your confirmation notice Occasionally AMA must change the location of a meeting within a city after announcing it. Thus, we urge you to double check the Registration Confirmation Notice you receive to be sure of your exact meeting location. If you have any questions, contact AMA's Registrar in New York (212) 246-0800.

Note: you can register up to the time of the meeting. However, do not come to a meeting without confirmation. If it has not arrived before the meeting date, contact AMA's Registrar.

What to do when you must cancel your registration Confirmed registrations cancelled less than two weeks before the meeting are subject to a \$100 service charge. Registrants with confirmed applications who fail to attend are liable for the entire fee unless they contact AMA's Registrar prior to the meeting to cancel.

How to receive priority treatment when you book hotel space AMA does not arrange hotel accommodations. However, the following hotels will hold a block of rooms up to two weeks before your course starts. To make a reservation, contact the hotel directly. Be sure to act promptly — and mention AMA for preferred treatment. **In Atlanta:** Colony Square Hotel (404) 892-6000 (Immediately adjacent to the AMA Management Center—Atlanta). **In Chicago:** Marriott Motor Hotel (312) 693-4444 (Immediately adjacent to the AMA Management Center—Chicago, at O'Hare Airport). **In New York:** Sheraton Centre (at Seventh Avenue and 52nd St.) (212) 582-6140, and the New York Hilton (at Rockefeller Center) (212) 594-4138. **In other locations:** Contact the hotel where your AMA courses will be held.

Tax deduction for educational expenses Treasury regulation §1.162-5 permits an income tax deduction for educational expenses (registration fees and cost of travel, meals and lodging) undertaken to: (1) maintain or improve skills required in one's employment or other trade or business, or (2) meet express requirements of an employer or a law imposed as a condition to retention of employment, job status or rate of compensation.

American Management Associations

World's largest, most respected source for management training. Founded in 1923 to advance the science of management, American Management Associations now spans the globe — offering thousands of activities to help members make greater contributions to their jobs, organizations and communities.

AMA takes no position on any public issue, speaks for no group and espouses no cause other than that of better management. AMA services include: courses, multimedia in-house training programs, books, magazines and others geared to the specific needs of executives in all levels of management.

The American Management Associations accepts registrations irrespective of race, sex, color, and national or ethnic origin. This includes but is not limited to admissions, employment and educational services.

MAKE YOUR HOTEL AND TRAVEL RESERVATIONS EARLY. ROOMS ARE FILLING FAST.

Round out your EDP knowledge!

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Are your name, title and address correct on the mailing label? If not, please indicate the necessary corrections and return the entire mailing piece in an envelope to: List Dept., AMA, 135 W. 50th Street, New York, N.Y. 10020.